



AIRS Level 2 Software Status

Sung-Yung Lee

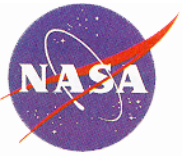
AIRS Science Team Meeting

May 2, 2002

Solvang, California

April 26, 2002

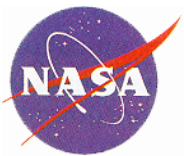
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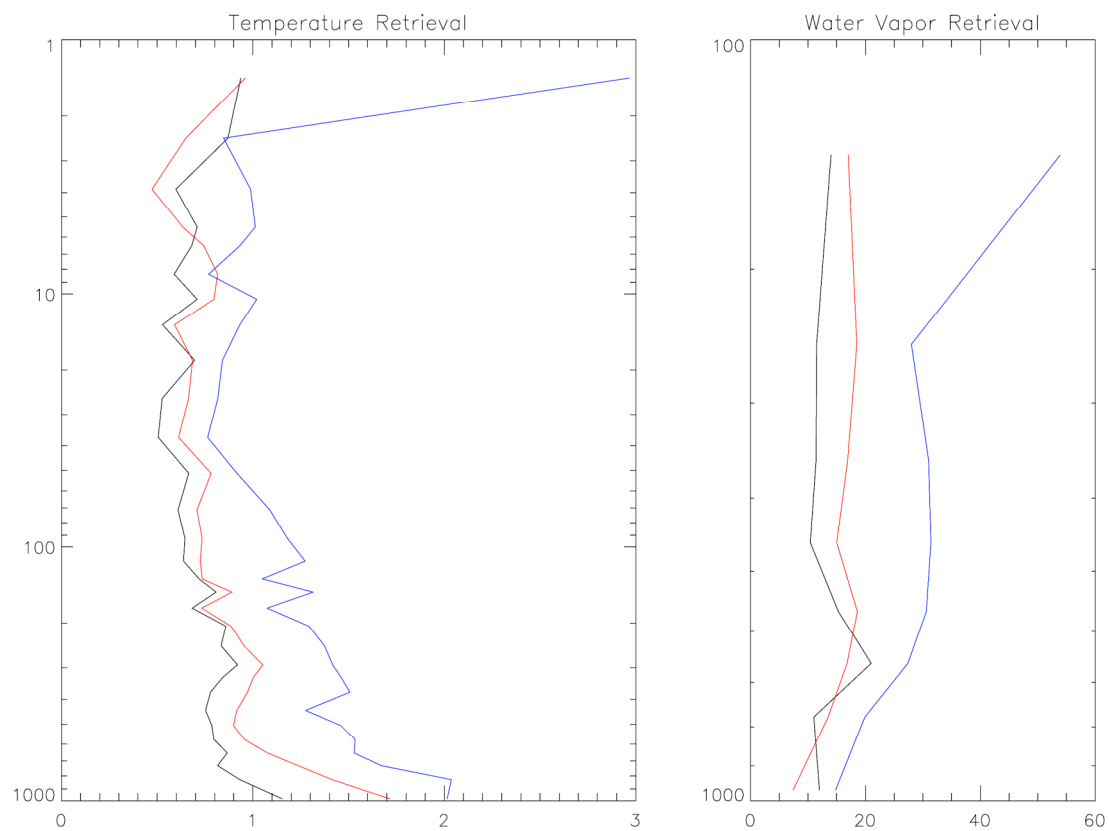
Current Status



- Version 2.2.3 is the current version
 - MW algorithm update
 - AMSU and HSB use their own zenith angles
 - Bug in HSB zenith angle
 - About 59% yield
 - Bug in sun glint distance calculation fixed
 - Missing/bad channels can be handled in final algorithm
- The next version, 2.2.4, is the launch ready version
 - New Masuda Surface Emissivity model
 - Final algorithm update
 - AIRS effective scan angle update
 - Expect about 69% yield
 - Process with 6 or more valid AIRS footprints within an AMSU footprint

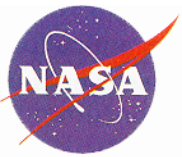


Current Retrieval Statistics

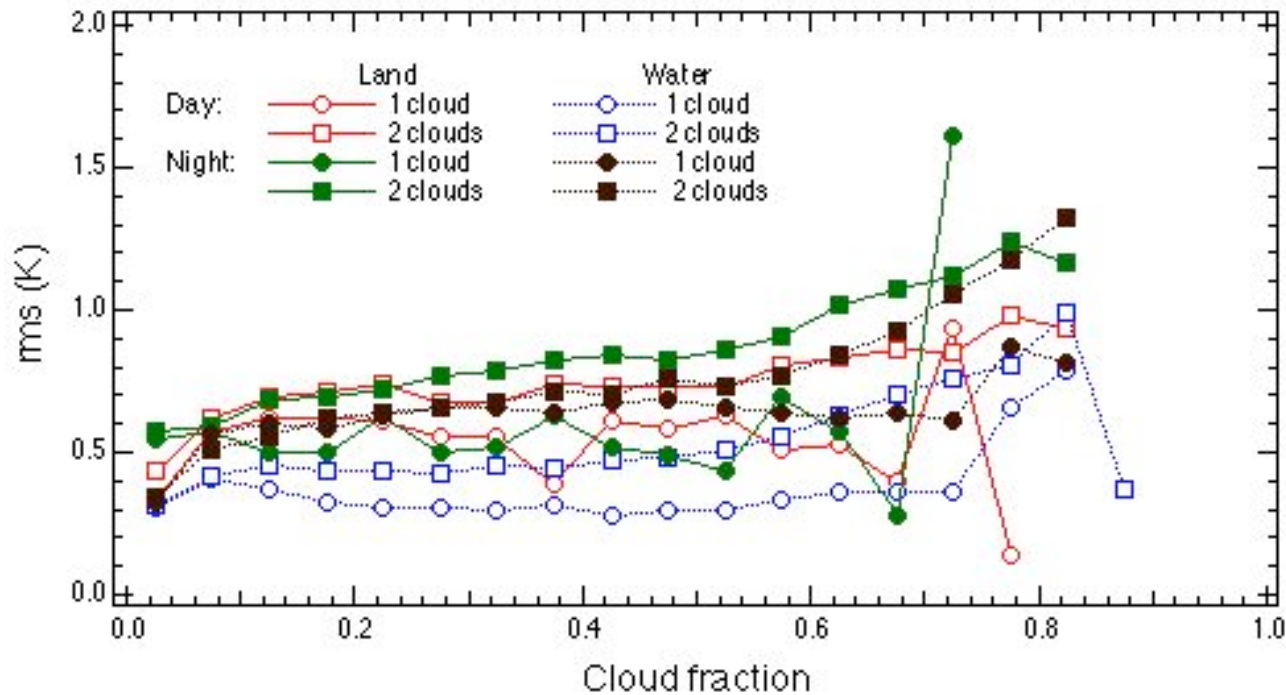


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Surface Skin Temperature Statistics

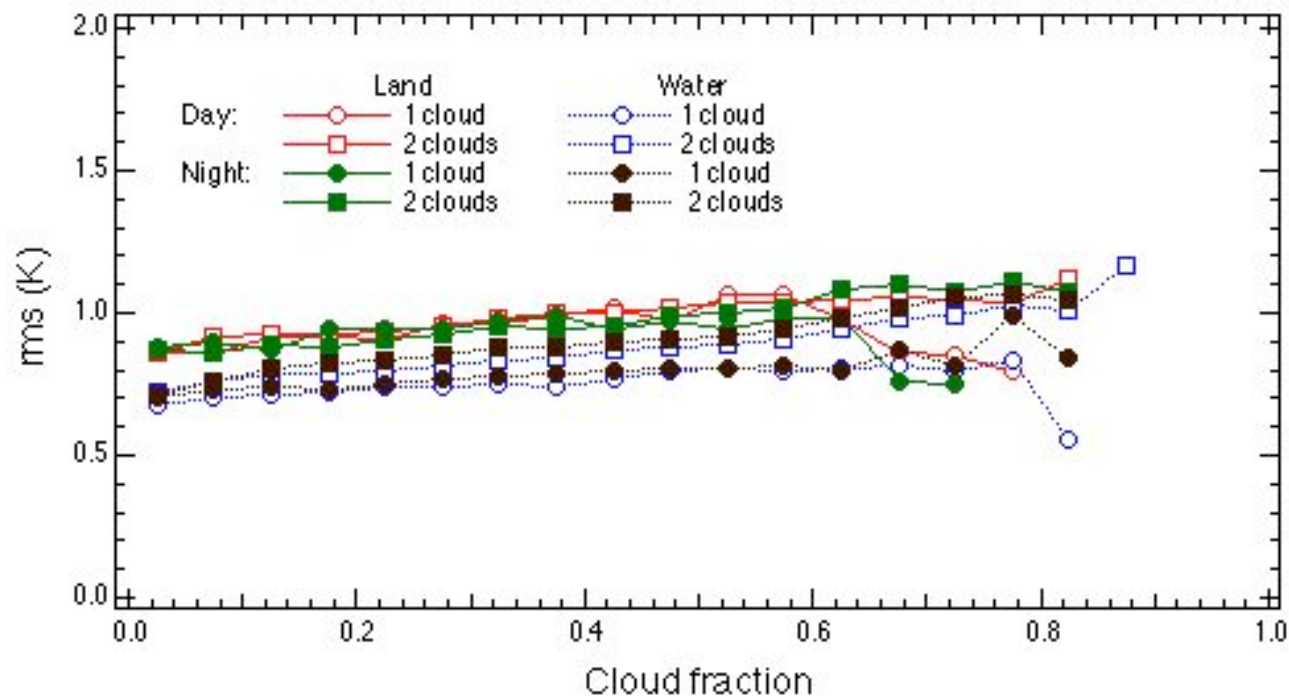


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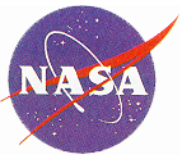


Tropospheric Temperature Statistics

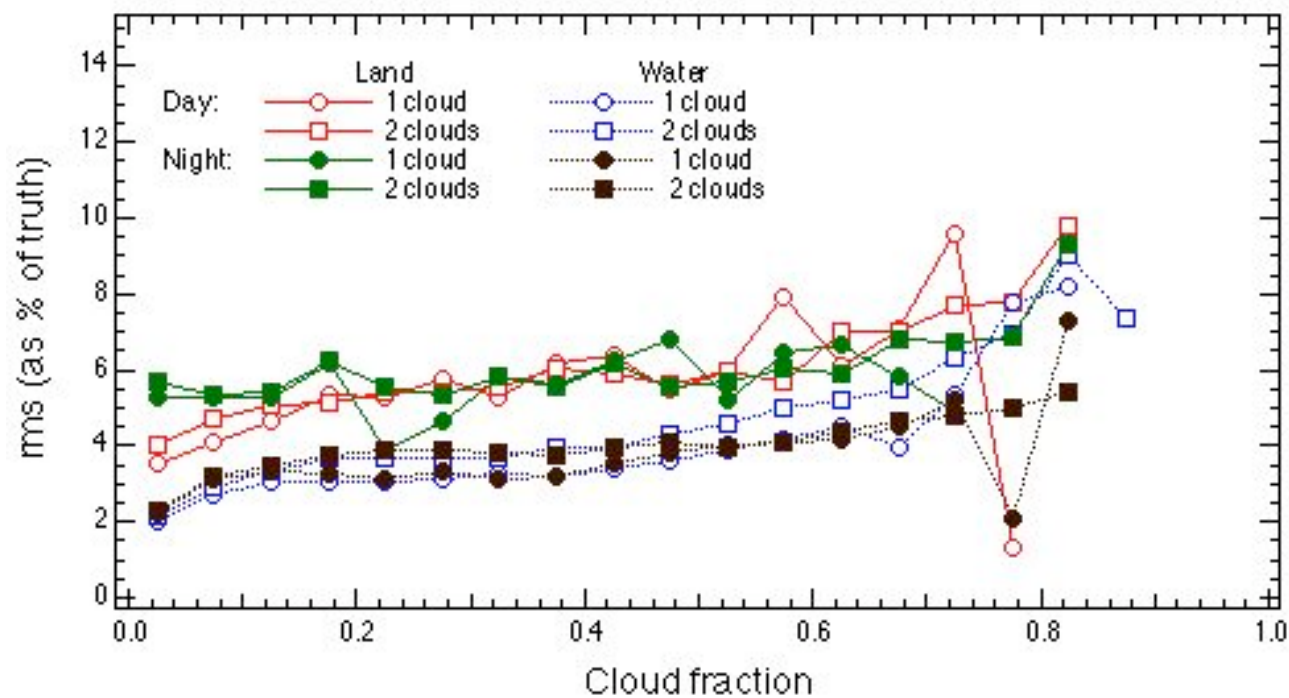
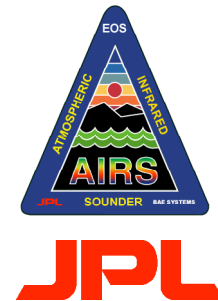


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Total Water Vapor Statistics

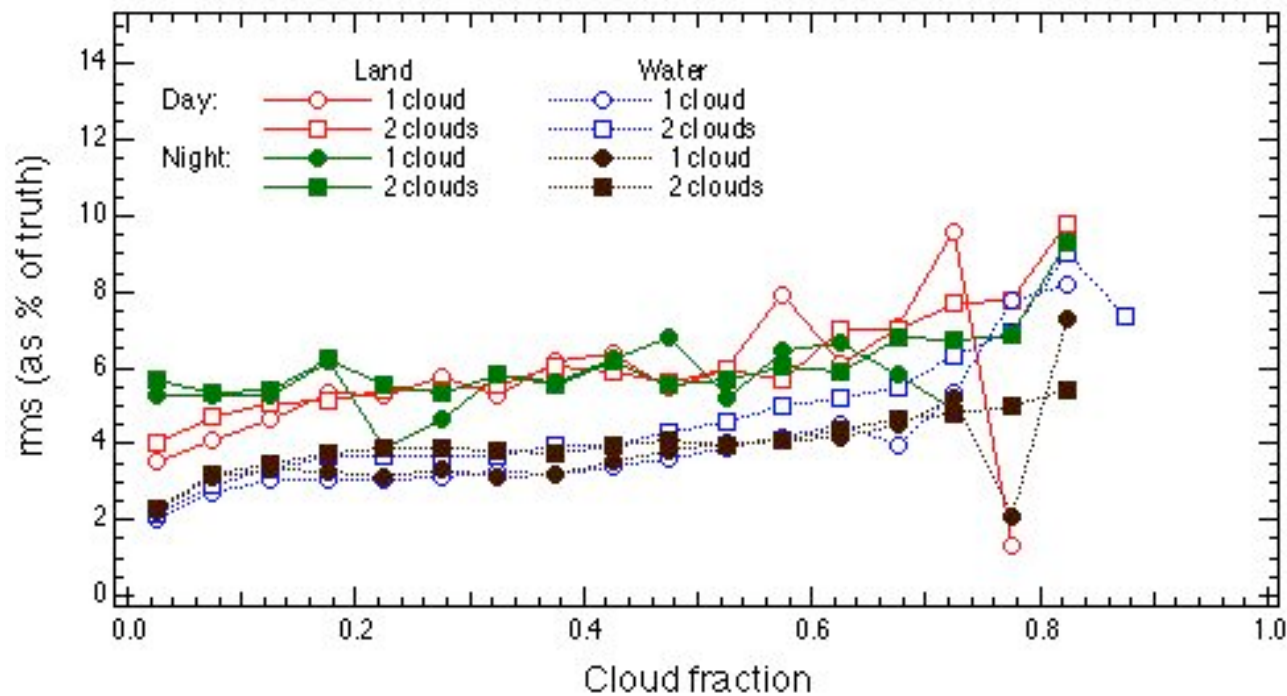


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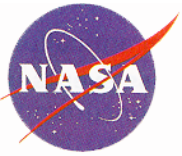


Total Ozone Burden Statistics



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Effective Scan Angle



- Level 2 software uses scan angle with respect to the instrument
 - Not recommended with real data
- AIRS RTA computes zenith angle at each of the pressure levels (up to 100)
 - Assumes spherical earth
 - Uses scan angle as an input
- Proposes a simple solution
 - Not the most accurate, but pretty accurate
 - Use zenith angle which has ellipsoidal earth and actual satellite orientation.
 - Compute and use effective scan angle

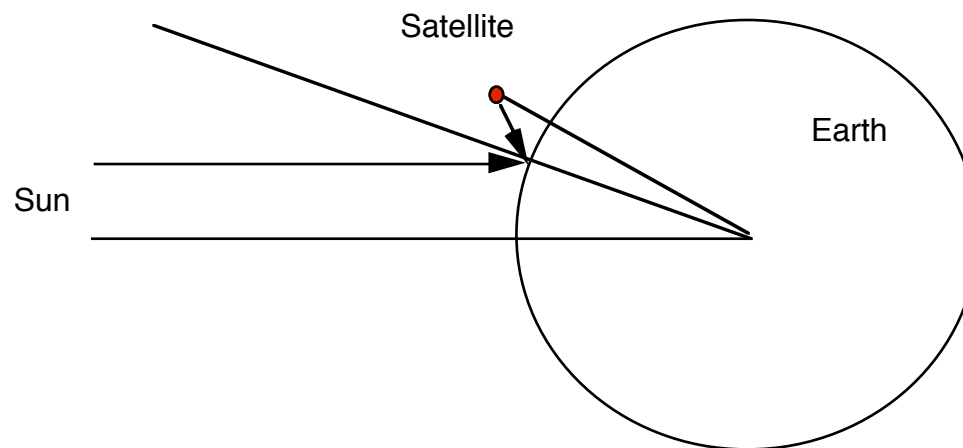
$$\left(1.0 + \frac{H_{\text{sat}}}{R_{\text{earth}}}\right) * \sin(\vartheta_{\text{scan}}) = \sin(\vartheta_{\text{zenith}})$$



Sun Glint



- Sun glint condition can exist about 12 minutes every orbit
 - When sun glint location is within 250 (TBD) km
 - Sun glint area shifts as season
 - As wide as 5th of AIRS swath



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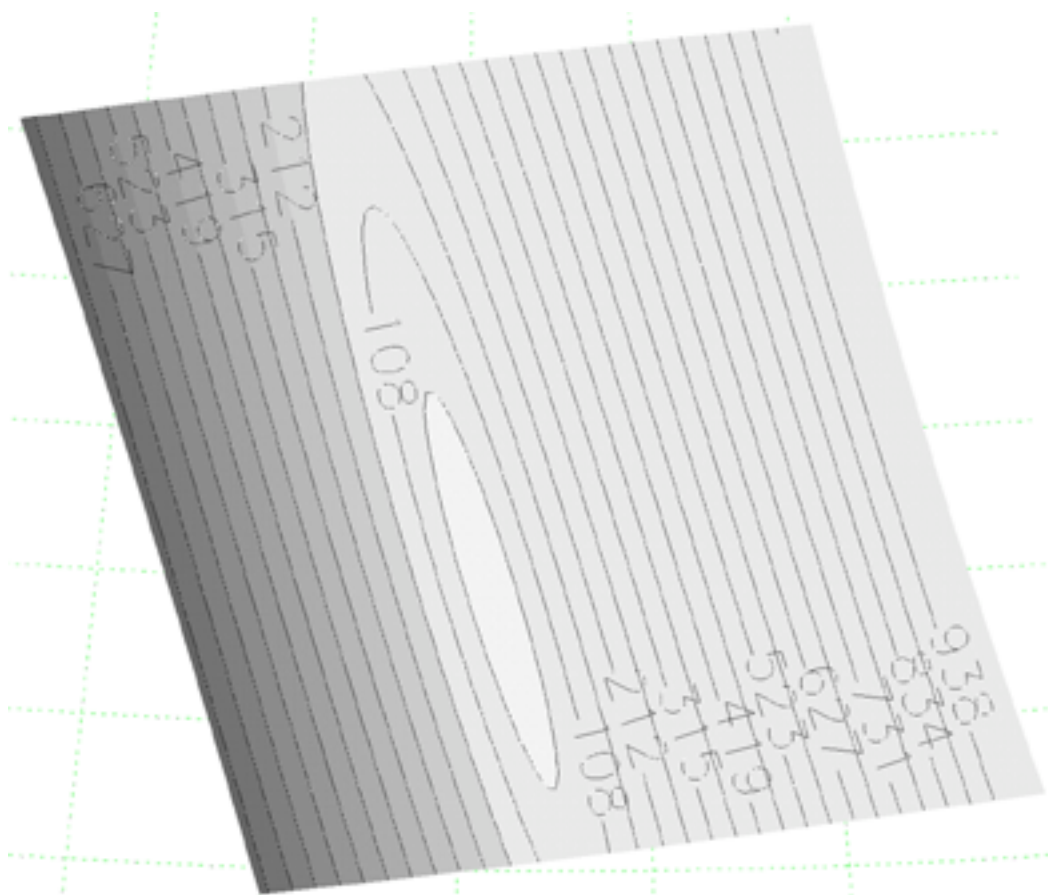
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Plot of Sun Glint Distance

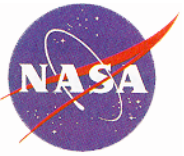


JPL



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Plan for Sun Glint



- After Launch plan
 - Can 4 micron IR channels saturate?
 - What is the maximum effect on radiances?
 - IR longwave channels
 - MW channels
 - Where are they affected the most?
 - MW channels over ocean
 - VIS/IR channels over cloud and possibly over ocean.
 - Is VIS glint flag a good predictor on IR channels?